

As a result of these special observations and a previous study of this subject, I offer the following suggestions with a view to securing greater uniformity in the making of frost observations.

Instructions are now in force directing that snow and ice observations be made at places designated by officials in charge of stations.

During periods when low temperature is liable to prove destructive to vegetation, frost reports are given wide dissemination by telegraph, and it would therefore seem that it is just as essential to require that frost observations be made at definite places as it is in the case of ice and snow observations.

Whether an observer finds light frost before completing a morning telegraphic report may sometimes depend upon the extent of his investigation. At some stations the conditions are such that it might work a hardship on an observer to require him to visit a certain designated place for the purpose of making a frost observation in addition to taking the regular morning observation. However, at practically all such stations the office force consists of two or more men, one of whom could make the frost observation and report the same, probably by telephone, to the observer who prepares the telegraphic report. This plan has been in satisfactory operation at Vicksburg during the past seven years.

Where frost observations are made in a definite place, the frost record for any year is directly comparable with that of any other year, even tho changes in the office force occur frequently. Altho the frost records of the Weather Bureau now show a high degree of accuracy, it is believed that more system in the manner of making the observations would result in still greater accuracy.

I would further suggest that at stations where ice and snow and (in case the foregoing plan is adopted) frost observations are made, the location of the places selected for making such observations be noted in the "station memorandum book". In case it should be deemed advisable to make any change in these locations, such changes should also be noted in the "station memorandum book", with reasons therefor, so that by reference to this book these places could be quickly found.

#### THE PHILIPPINE WEATHER BUREAU.

The Director of the Philippine Weather Bureau, Rev. José Algué, S. J., thru the assistant director, José Coronas, S. J., calls attention to the fact that the observers and employees, both of the observatory and of the meteorological stations thruout the islands, are not mostly Spaniards, as stated in the MONTHLY WEATHER REVIEW for November, 1906, page 517, but are native Filipinos, altho they bear Spanish names; and that, moreover, the only Jesuits actually engaged in the Philippine Weather Bureau are the five officers who constitute the staff of the Manila Central Observatory. He adds:

"Whilst greatly appreciating the courteous praise given our work in the Philippines, we desire that due credit be given to the native observers, whom we find well qualified for such work."—C. A.

#### MAY WEATHER AT BANGOR, MAINE.<sup>1</sup>

According to the monthly report of the weather compiled by Bangor's veteran observer, F. S. Jennison, the month of May was not such a bad one after all. He furnishes a list of the average temperatures for the month of May for the past fifteen years, and during this time, from the point of average, the past month has been the coldest, but the difference in the temperature has been but a very few degrees. The month would not have seemed so cold had it not been for the prevalent winds from the north and northwest. In 1902 the month of May was nearly as cold as the month just past, there being hardly

a noticeable difference in the average temperatures of the two months.

On May 7 it snowed for several hours, but it melted almost as soon as it fell. The heaviest rain of the month came on the 27th and 28th. There was a heavy frost May 21, and all during that week there were slight frosts. The mercury stood at 76° on the 19th, which was the warmest day of the month.

The following is the list of the average temperatures for the month of May for the past fifteen years:

Years.	6 a. m.	Noon.	6 p. m.
1907.....	35	55	36
1906.....	45	62	57
1905.....	39	58	52
1904.....	42	65	59
1903.....	43	67	60
1902.....	35	54	46
1901.....	36	63	49
1900.....	36	52	46
1899.....	39	62	51
1898.....	36	64	54
1897.....	39	55	47
1896.....	43	62	55
1895.....	49	67	54
1894.....	44	61	51
1893.....	40	60	53

#### MAY—PAST AND PRESENT.<sup>1</sup>

By E. D. LARNED. Pated Thompson Hill, Windham County, Conn., June 1, 1907.

No, this is not the worst May experienced. It has not even broken my 56-year record. That feat was accomplished in 1882 with its mean temperature below 50°. In the matter of snow it had no snow worth mentioning, only a four hours' fall on the 11th, which did not even whiten the ground. Here is a sample from Ashford Town Book:

On the fifth day of May, 1761, a very  
Stormy day of snow—an awful sight—  
The trees green and the ground white;  
The sixth day the trees on the blow  
And the fields covered with snow.

EBENEZER BYLES, *Town Clerk*.

Woodstock, May 1, 1761.—The snow began in the morning about sunrise as hard as most ever was known in the winter and was attended with a hard northeast wind. Snowed hard till sundown.

May 19, 1763.—A bad snowstorm.

In recent years we have from Doctor Robbins:

May 10, 1831.—Ground mostly covered with snow. School children threw snowballs and sang gleefully.

"On the 21st of May  
The snow lay in the way" in 1842.

And as for cold, Rev. Abel Stoles reports May 31, 1764:

At night the severest frost in memory.

Our Thompson journalist, Joseph Joslin, agrees with Doctor Robbins in reporting the severities of 1816, with more picturesque detail, such as "Very exceeding cold", "A very large black frost", "Ice froze as hard as window glass", "Ice on grass top like sheet", "Wore coat, jacket, surtout, and wig and none too hot". The perversity of this season extended till late autumn, causing great distress and scarcity. My father harvested his bushels of "nubbins" in great coat and mittens.

Victoria's accession to the throne was noted as the fulfillment of an ancient prophecy, viz:

By the power to see through the ways of Heaven  
In one thousand eight hundred and thirty-seven,  
Shall the year pass away without any spring  
And on England's throne shall not sit a King.

The May of 1882, mean temperature 49.27°, exceeded all within my period of observation in unmitigated severity and backwardness. Twenty-five of its mornings were below frost point. An old friend whose birthday, May 17, had for ninety

<sup>1</sup> This article consists chiefly of a letter from Miss Larned, printed in the Hartford Courant of June 4, 1907. Additions have been made from a personal letter.—EDITOR.

<sup>1</sup> Reprinted from the Bangor Daily Commercial of June 1, 1907.

years been greeted with apple blossoms missed even an opening bud on the ninety-first. My early harvest<sup>\*</sup> in its sunny nook showed but the slightest tint of red on the 25th; lilacs failed to come out for Memorial Day. It may be said that the general backwardness mitigated the damage. The cold Memorial Day of 1884 was followed by the frost which wrought such havoc in market gardens, especially in the vicinity of New York. An eclipse of the sun on the 18th, with unfavorable planetary conjunctions, was held responsible for the perversity of 1882, and its general character—cold, cloudy, windy, moisty—justified the epithet, *eclipsy*, in that it eclipsed all previous specimens.

Next to it on my own record comes this May of 1907 with mean temperature of 50.39°, maximum of 85°, on the 14th, and minimum of 30° on the 12th. Lilacs on Memorial Day of 1907 were fairly usable; in 1888 they were overblown. In cloudiness 1907 has nearly paralleled 1882. The mean of May for fifty years on Thompson Hill was 55.83°; warmest in 1880, 62.33°; range, 13.06°; maximum point 90° in 1880; minimum 27° in 1882 and 1861. Other cold Mays were: 1861, mean 52.21°; 1888, 52.28°. The Mays of 1900, 1901, 1902 were about 3° below the average.

And yet, after all our grumbling, May is May—in spite of Hosea Biglow, who says it is more like “Maynt”. Frost can not conquer it, nor custom stale its infinite variety. The trees are now nearly in full leaf. The green of the grass was never so vivid, violets never so blue, dandelions never so plentiful nor golden.

#### MEMORANDUM ON THE GULF STREAM AND THE WEATHER.

The rather unusual weather of the spring and early summer of 1907 has lead many to ask for the cause, and whether, perhaps, climatic conditions have undergone a permanent change. The statement of a ship captain, or, more properly, that of a newspaper correspondent, to the effect that the location of the Gulf Stream has been altered by earthquakes has led many to imagine that such a change would affect the climate, and that possibly the times of planting, harvesting, etc., will have to be revised.

All of these suggestions and queries show such an entire ignorance of the laws that govern the atmosphere and the weather that it may be worth while to state authoritatively that earthquakes have no appreciable influence on the atmosphere, neither its temperature nor its wind nor its rain.

If any earthquake has had an influence on ocean currents, such as the Gulf Stream, it can only have been by reason of a change in the configuration of the bottom of the ocean; and such changes have always been so small that it is not believed that anyone or a combination of several such could have any appreciable influence on the Gulf Stream.

The Gulf Stream does not itself have any direct specific influence on the climate of North America. In that part of its course off the coast of the South Atlantic States easterly winds bring warm, moist air to the shore; but they would do so if there were no Gulf Stream since the surface of this part of the ocean is warm water, and the easterly winds would always bring its warmth and moisture to the land. In the northern part of its course, opposite the Middle Atlantic States, there is comparatively little east wind, and of course the west wind blows in the wrong direction.

The weather conditions of the South vary from year to year, but the climate, considered as the average of a century, does not change. We have records of unusual variations ever since the arrival of Columbus, and we must expect the same for ages to come. There may possibly be cycles in climate, but we have not yet been able to discover them or define them;

and if they exist they certainly represent such small periodic changes as would be utterly insignificant to the planter.

The irregular variations in the weather from day to day and from season to season are due to irregular changes in the general circulation of the atmosphere, by reason of which the air that moves toward the equator and returns toward the poles makes a different circuit every time. The great irregularities of the weather that affect mankind are not due to sun spots, nor to the moon or stars, nor to earthquakes, nor to any other influence outside of the atmosphere, but result from its own internal mechanism. The great masses of air are surging to and fro over the earth's surface like the water boiling in a great caldron; any little float carried along in this water will circulate from the center to the edge and from top to bottom over and over, and yet never go thru the same path twice. In a similar way we never have the same identical sets of winds, temperatures, and rains year after year, but only general seasonal resemblances; and it would take several centuries to show the extreme limits of variability at any given locality. Between the Rockies and the Atlantic we are peculiarly subject to irregularities in cold northerly winds, which on the one hand may bring freezing weather to the Gulf coast, but on the other hand by pushing aside the warm moist air near the ground give rise to large areas of cloud and rain or snow, so that the irregularities in our weather are traceable back to irregularities in the interchange of air between the Tropics and the polar regions.

It has been suggested that a thoro investigation be made into the reliability of the report as to changes in the Gulf Stream—but this report is known to be utterly unreliable. The position of the Gulf Stream can not be ascertained by one observation by any ordinary navigator. Such work would require that a vessel be specially fitted out for the purpose and sail to and fro across the stream at many points, making careful observations of temperature of the water and other data. This was done years ago most thoroly by the cooperation of the Navy, the Coast Survey, and the Bureau of Fisheries, and if it were really worth while, the work could be repeated occasionally. But the exact course of the Gulf Stream has but little interest to meteorologists, however important it may be in questions bearing on the fisheries or on the drift of derelicts and other nautical matters. In fact, the surveys already made show that the surface waters of the Gulf Stream are liable to be pushed aside to a distance of a hundred miles by variations in the winds, those same winds that also affect the climate. It is not the Gulf Stream that affects the winds and the climate, but the winds that affect both the climate and the Gulf Stream. The winds are the prime factors in maintaining and altering the surface currents of the ocean.

The mild climate of western Europe and the still milder climate of the coast of Alaska, British Columbia, and Oregon, are not due to either the Gulf Stream of the Atlantic or the Japan Stream of the Pacific, but to the steady flow of winds laden with moisture from the ocean in general. The severe climates of China, Japan, New England, and Labrador are not due to the distances of the Gulf Stream or the Japan Stream from the respective coasts, but directly to the dry, cold northerly winds themselves.—C. A.

#### CLIMATE AND AGRICULTURE.

The following is an outline of a course of lectures by Prof. T. L. Lyon, of the New York State College of Agriculture, at Cornell University, delivered during the summer of 1906 before the students of the graduate school of agriculture at the University of Illinois, conducted under the auspices of the Association of Agricultural Colleges and Experiment Stations. The author states that in continuation of his studies in wheat and maize, he is intending to publish a paper on the relation

<sup>\*</sup>That is, early harvest apple tree.—EDITOR.